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Office Memorandum • UNITED STATES GOVERNMENT

TO : The Files - RD-103, T.O. 8

DATE: 29 May 1959

FROM :

SUBJECT: (AS-6 Power Supply)

1. On 26 May 1959 a conference was held with [] of the [] to discuss the progress of the radioisotope power supply which [] is building for the AEC as part of our AS-6 program.

2. [] was given the results of our [] field tests of the prototype [] power supply which used a radioisotope battery fueled with polonium 210. No difficulty was encountered with the battery or its radioisotope-thermocouple recharger, but two failures occurred in the [] power conversion equipment included in the power supply box. The 300 vdc converter refused to start under load and a Zener diode in the regulator box short-circuited. Both problems were remedied by field expedients. The prototype power supply was left at [] for continued testing of the AS-6.

3. The primary purpose of [] visit was to describe the proposed layout of the operational AS-6 power supply due to be delivered by [] on 30 August. A special NICAD cell developed for the Terrier and Tartan missiles is being tested by [] and will probably be used in the final power supply. This cell has a capacity of 5.6 ampere hours but is equivalent in size to a 3 ah cell. (The battery used in the present prototype has a 5 ah capacity). Converting to the smaller cell will reduce the weight of the battery by 4 lbs. and, more importantly, permit one stack of batteries instead of two around the spherical thermoelectric generator. The charger/battery combination will thus have a flat configuration (approximately 8 x 12 x 9 inches) rather than the present cubical form approximately 12 x 12 x 11 inches.

4. [] recommended placing the [] power converter in a hermetically sealed container separate from his 28 volt battery instead of in the same box with it. The two boxes would then be bolted together and for all practical purposes would be handled in the field as one unit, measuring approximately 8" x 13" x 15". This would allow [] to seal the battery charger and begin a 30-day environmental test without waiting for the [] equipment to be delivered. According to [] last minute delivery of the prototype [] converters caused a drastic redesign, of the [] box which had to be enlarged by 30% to accommodate their unexpectedly large size.

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5. As a final recommendation [] suggested that [] package and seal its own converters in the second power supply box to be supplied, if necessary, by []. This unit after assembly and sealing could be system tested by [] with the final AS-6 using any 28-volt battery as a primary power source. After separate testing of both boxes [] would interconnect them using terminal strips and bolt both units together for a total power size of 8" x 13" x 16". [] estimated that the weight of the complete power supply would be 31 pounds, depending upon the success [] has in reducing its 17 pound converter units to the expected 5 pounds.

6. [] was told that his suggestions appear likely to result in a superior product, and that our [] experience had shown that the converters should be tested at length in conjunction with the transmitter. He was reminded, however, that [] is doing this program for the AEC and that any changes, however minor, have to be approved by that agency. [] said that Col. Anderson of the Aircraft Reactors Branch of the AEC was aware of this conference and was anxious to hear our reaction to the proposed changes.

7. [] suggestions were received favorably by [] of [] who said he preferred to retain control over the wiring and assembly of the [] converters. [] agreed to send two prototype converters (one high-voltage and one low-voltage) to [] for their use in determining the dimensions of the box which [] should use for its half of the final AS-6 power supply.

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